



MONTGOMERY COUNTY EXECUTIVE REGULATION

Offices of the County Executive • 101 Monroe Street • Rockville, Maryland 20850

| | |
|---|-----------------|
| Subject FIRE SAFETY CODE – FIRE PROTECTION SYSTEMS | Number 19-13 |
| Originating Department DEPARTMENT OF PERMITTING SERVICES | Effective Date |

Montgomery County Regulation on:

FIRE SAFETY CODE - FIRE PROTECTION SYSTEMS
Montgomery County Department of Permitting Services
And Montgomery County Division of Fire and Rescue Service

Issued by: County Executive
Regulation No: 19-13
COMCOR 22.00.06

Authority: Code Section 22-13
Supersedes: Executive Regulation 9-12 AM
Council Review: Method 2 under Code Section 2A-15
Register Vol. 30, Issue 11
Effective Date:
Comment Deadline: December 4, 2013

SUMMARY: This regulation adopts and modifies certain standards published by the National Fire Protection Association (NFPA) involved with the installation, testing and maintenance of certain fire protection systems as required by the Montgomery County Building Code, the Montgomery County Fire Safety Code, and the Maryland State Fire Prevention Code. The changes do not retroactively apply to unaltered existing buildings, existing systems or existing conditions permitted or approved before the date of adoption of this regulation, unless inimical or distinct hazard exists.

The Department of Permitting Services has been delegated the authority by the Fire Chief (of Montgomery County Fire and Rescue Service) to adopt regulations pursuant to Chapter 22 of the Montgomery County Code in the cases of a new building, a new system, or new conditions.

Existing buildings, existing systems, or existing conditions which are altered are subject to this regulation to the extent required by the Maryland Building Rehabilitation Code, the Montgomery County Fire Safety Code, and the Maryland State Fire Prevention Code. Unaltered existing buildings, existing systems, or existing conditions are not subject to this regulation where no inimical or distinct hazard exists.

ADDRESSES: Department of Permitting Services
255 Rockville Pike, 2nd Floor
Rockville, MD 20850



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STAFF: For further information, contact Joseph Felton, Manager, Division of Building Construction, 240-777-6208.

COMCOR 22.00.06 Fire Safety Code – Fire Protection Systems

22.00.06.01

In accordance with the procedures authorized in Chapter 22, "Fire Safety Code", of the Montgomery County Code, [1996]2004, this Executive Regulation applies to the design, installation, and maintenance of fire protection systems in buildings or structures. Where there are differences between this regulation and the Montgomery County Building Code, the more restrictive provision(s) will apply.

In this regulation the term "Fire Chief" means the Fire Chief of the Montgomery County Fire and Rescue Service and includes the Fire Chief's designees.

The Department of Permitting Services has been delegated authority by the Fire Chief to enforce the requirements of the Montgomery County Fire Safety Code as it pertains to new facilities, elements, structures, and conditions.

Existing buildings, existing systems, or existing conditions which are altered are subject to this regulation to the extent required by the Maryland Building Rehabilitation Code, the Montgomery County Fire Safety Code, and the Maryland State Fire Prevention Code. Unaltered existing buildings, existing systems, or existing conditions are not subject to this regulation.

These regulations supersede Regulation No. [6-06AM] 9-12AM only to the extent that Regulation No. [6-06AM] 9-12AM applies to new construction and alterations to existing buildings, existing systems, or existing conditions.

22.00.06.02

All references to the National Fire Codes and standards adopted in these regulations are to those codes, standards, recommended practices, and manuals in the National Fire Codes, published by the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269. Unless otherwise noted, all references are to those codes and standards published in the [2009] 2012 edition of National Fire Protection Association's Fire Code (NFPA 1) and are adopted in their entirety.

Terms used in this regulation which are defined in the state adopted consensus codes shall have the definitions of the consensus code.

22.00.06.03

Designs for smoke management systems shall be submitted for review and approval as part of a



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building permit. Submittals for smoke management systems shall include:

- (a) Plans and specifications
- (b) Engineering calculations and/or computer model
- (c) Floor plans
- (d) System diagrams and details
- (e) Sequence of operations and control layout
- (f) Preliminary test procedures
- (g) Acceptance test procedures
- (h) Pass/fail criteria
- (i) Maintenance requirements including periodic testing criteria

22.00.06.04

NFPA 13, paragraph 7.2, add the following: Dry pipe systems may only be installed where heat is not adequate to prevent freezing.

[22.00.06.04] 22.00.06.05

NFPA 13, paragraph 8.1.1, add new paragraph (8) as follows:

- (8) Sprinklers are required under attached balconies or porches unless at least 50 percent of the longest exterior side is open to the atmosphere.

22.00.06.06

NFPA 13, paragraph 8.3.2.1 is amended as follows: Ordinary temperature - rated sprinklers shall be used throughout buildings.

[22.00.06.05] 22.00.06.07

NFPA 13, Section 8.3.2.4, add the following: "Intermediate temperature sprinkler heads shall only be installed if an acceptable layout can not be achieved without a sprinkler head in the high temperature area."

[22.00.06.06] 22.00.06.08

NFPA 13, paragraph 8.4.5.1, add: Listed residential sprinkler heads shall be used in dwelling units except Detention and Correctional occupancies.

[22.00.06.07] 22.00.06.09

NFPA 13, paragraph 8.15.7, add: Any canopy with the potential for extended vehicle standing or



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parking below shall have sprinkler protection on the underside of the canopy.

22.00.06.10

NFPA 13, Paragraph 8.15.8, add a new paragraph:

8.15.8.1.2.1. Sprinklers shall not be installed directly above shelving.

[22.00.06.09] 22.00.06.11

NFPA 13, paragraph 8.15.10.3 is deleted.

[22.00.06.08] 22.00.06.12

NFPA 13, paragraph 8.15.14.1, add a sentence at the beginning that reads: For new ceiling installations, drop-out ceilings shall be prohibited.

[22.00.06.10] 22.00.06.13

NFPA 13, paragraph 8.15.19.1 is amended as follows: In new installations expected to supply sprinklers below a ceiling and in any speculative areas subject to tenant changes, minimum one inch sprinkler outlets shall be provided.

[22.00.06.11] 22.00.06.14

NFPA 13, paragraphs 8.16.1.1.1 and 8.17.1.1, add: When a sprinkler system serves more than one level, each level must be consistently and separately valved by a listed and approved control valve. In addition, where a sprinkler system is required to activate a building fire alarm system, the sprinkler system shall have a separate and distinct water flow detecting device for each floor and zone.

Exception 1: In buildings not exceeding three floors and 3000 square feet per floor.

Exception 2: Unoccupied and unused attics may be zoned with the level below.

Exception 3: Mezzanines not exceeding 3000 square feet in area.

Exception 4: Detention and correctional facilities.

[22.00.06.12] 22.00.06.15

NFPA 13, paragraph 8.17.2, add the following requirements for fire department connections:

- (a) Shall be located within 100 feet from a fire hydrant, and between 18 and 48 inches from grade to the centerline of the inlets.
- (b) Number of 2 1/2 in. inlets:



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| System Demand (gpm) | No. of Inlets |
|---------------------|---------------|
| up to 749 | 2 |
| 750-999 | 3 |
| 1000 and above | 4 |

- (c) Multiple connections for the same building shall be interconnected.
- (d) When a section of a building is fed by a connection (i.e., partial systems), permanent all weather identification signs shall be provided on connections.
- (e) Shall be sized at least as large as the main sprinkler system riser pipe or the fire pump discharge line, whichever is larger.

[22.00.06.13] 22.00.06.16

NFPA 13, paragraph 11.1, add: Calculations for new systems or new portions of systems shall meet the criteria below.

- (a) Highest hazard and most demanding use allowed by building construction permit or property zoning.
- (b) Storage use: Available storage height for high storage of a class 4 non-encapsulated material.
- (c) Laboratory use: ordinary group 2 for class A, B, or C labs.
- (d) All uses: 20% safety factor. For systems without a pump, this is based on the demand pressure only at the supply point. For systems with a pump, this is based on both the demand pressure and demand flow at the pump discharge. All design options, except grids, must be explored.

Exception to safety factor only: Owner occupied buildings may use a lower safety factor if a pump would be necessary to achieve the 20%.

22.00.06.17

NFPA 13, paragraph 21.15.2.2.1.4, add: Sprinklers protecting chutes must be supplied by a single riser with a flow switch and a tampered indicating valve supervised by the fire alarm system.

[22.00.06.14] 22.00.06.18

NFPA 13, paragraph 23.1.2, add: Pressure and flow availability as determined by a hydraulic information sheet received from a public utility shall be used for new taps. Pressure and flow availability for existing taps shall be determined by an interior flow test. In any case, the supply information shall be corrected for the low hydraulic gradient. Fire pumps and fire pump/tank supplies shall only be used where it is demonstrated that the public water supply is inadequate.

[22.00.06.15] 22.00.06.19



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NFPA 13, paragraph [24.2.1] 24.2.1.11, add: Sprinkler heads shall not be installed in plastic pipe until after the hydrostatic test is passed.

[22.00.06.16] 22.00.06.20

NFPA 13D, paragraph 1.1, add: This standard also applies to Day care homes containing 12 clients or less if located within converted one and two family dwellings or townhouses.

[22.00.06.17] 22.00.06.21

NFPA 13D, paragraph 4.3. Add a new paragraph:

4.3.3: Sprinkler heads shall not be installed in plastic pipe until after the hydrostatic test is passed.

[22.00.06.18] 22.00.06.22

NFPA 13D, paragraph 6.1, add: Pressure and flow availability as determined by a public utility must be used and shall be adjusted to the low hydraulic gradient. Booster pumps and pump/tank supplies shall only be used where it is demonstrated that the public water supply is inadequate as determined by the director of the Department of Permitting Services.

[22.00.06.19] 22.00.06.23

NFPA 13D, paragraph 6.2: Add section (6)

(6) System specific data plate on durable material to be fixed at sprinkler system main riser.

[22.00.06.20] 22.00.06.24

NFPA 13D, paragraph 6.2.2(6), add to the end of the sentence "and shall be raised a minimum of 1 ½ inches off the floor."

[22.00.06.22] 22.00.06.25

NFPA 13D, paragraph 7.5.5, add new paragraph 7.5.5.4:

7.5.5.4 Dry type sprinklers shall be used in areas which are not heated to at least 40 degrees F.

[22.00.06.21] 22.00.06.26

NFPA 13D, section 7.5.5.1, add: Where possible to maintain listed coverage, sprinkler heads shall be positioned so as to eliminate the need to install sprinkler heads of a higher temperature rating.



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[22.00.06.23] 22.00.06.27

NFPA 13D, paragraph 8.2.5, add paragraph 8.2.5.1.1:

8.2.5.1.1 Sprinkler heads in closets shall not be located directly above shelves.

22.00.06.28

NFPA 13D, paragraph 8.3.2: Delete sub-sections (1) & (2).

22.00.06.29

NFPA 13D, paragraph 8.3.3 is replaced to read: "Antifreeze systems are prohibited."

22.00.06.30

NFPA 13D, paragraph 8.3.4 is replaced to read: "Dry systems are prohibited."

22.00.06.31

NFPA13D, paragraph 8.3.4.2 is replaced to read: "Preaction systems are prohibited."

[22.00.06.24] 22.00.06.32

NFPA 13D, paragraph 8.4, add: All calculations shall include at least a 10% safety factor to account for minor field changes, unless a booster pump is necessary to obtain this safety factor.

[22.00.06.25] 22.00.06.33

NFPA 13D, paragraph 8.6.4, add the following after garages: "...unless located partially or wholly beneath living space."

22.00.06.34

NFPA 13D, paragraph 8.6.5.1 is deleted.

22.00.06.35

NFPA 13R, paragraph 5.4.2, add: Antifreeze, dry pipe and preaction systems are prohibited in dwelling units and interior corridors leading to dwelling units.

22.00.06.36



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NFPA 13R, paragraph 6.4.6.3.2.1, add: Pendent sprinkler heads in closets shall not be located directly above shelves.

22.00.06.37

NFPA 13R, paragraph 6.4.6.3.3.1, add: Sidewall sprinkler heads in closets shall not be located directly above shelves.

[22.00.06.28] 22.00.06.38

NFPA 13R, paragraph [6.7.4.2] 6.11.1 is [replaced] amended to read: "In all apartment buildings, at least one fire department connection shall be provided for buildings accessible by the fire department, that exceed 2000 square feet or are more than a single story. The fire department connection shall be a minimum of one 2 ½ inch inlet with a feed line sized at least as large as the main system riser. The fire department connection shall be located on a fire department access road and be 18 to 48 inches from the centerline of the inlet to finish grade."

[22.00.06.29] [NFPA 13R, paragraph 6.8.1.5.3.2 is amended to add subparagraph (e):]

[(e) Sprinkler heads in closets shall not be located directly above shelves.]

[22.00.06.30] [NFPA 13R, paragraph 6.8.1.5.3.3 is amended to add subparagraph (e):]

[(e) Unprotected bulkheads or soffits behind the spray of sidewall sprinklers shall not exceed 8 inches in width for residential sidewalls and 12 inches for dry sidewalls.]

[22.00.06.31] 22.00.06.39

NFPA 13R, paragraph [6.8.4] 7.4, add: All calculations shall include at least a 10% safety factor to account for minor field changes, unless a listed fire pump is necessary to obtain this safety factor.

[22.00.06.27] 22.00.06.40

NFPA 13R, paragraph [6.6.3] 9.3, add: Pressure and volume availability as determined by a public utility shall be used and shall be adjusted to the low hydraulic gradient. Booster pumps and pump/tank supplies shall only be used where it is demonstrated that the public water supply is inadequate.

[22.00.06.26] 22.00.06.41

NFPA 13R, paragraph [6.4.2] 10.2.2. Add a new paragraph:

[6.4.2.3] 10.2.2.3 Pendent and sidewall sprinkler heads shall not be installed in plastic pipe until after the hydrostatic test is passed.



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[22.00.06.32] 22.00.06.42

NFPA 14, paragraph [4.7.2] 4.8.2 is amended as follows: Each fire hose valve shall be provided with a 2 1/2 in. hose connection, 2 1/2 in. to 1 1/2 in. reducer, cap, and chain.

[22.00.06.33] 22.00.06.43

NFPA 14, paragraph 5.1.2, add:

- (1) Systems shall be automatic wet type.
- (2) Standpipe systems in unheated areas shall be automatic dry type.
- (3) Standpipe systems in detached open parking garages may be the manual dry type, if the piping is air supervised for breaks or open valves.
- (4) Occupant use hose is prohibited in new or existing buildings.
- (5) New standpipe systems shall be Class I only.

[22.00.06.34] 22.00.06.44

NFPA 14, paragraph 6.4 (Fire Department Connections), add:

- (1) Number of 2 1/2 in. inlets:

| System Demand (gpm) | No. of Inlets |
|---------------------|---------------|
| up to 749 | 2 |
| 750-999 | 3 |
| 1,000 and above | 4 |

- (2) Multiple connections on the same building shall be interconnected.
- (3) When a section of a building is fed by a connection (i.e., partial systems), permanent all weather identification signs shall be provided on connections.

[22.00.06.35] [NFPA 14, paragraph 7.3.2(1), amend to read:]

["At the highest intermediate landing between floor levels or each main landing in every required exit stairway"]

[22.00.06.36] 22.00.06.45

NFPA 14, paragraph [7.3.2.3] 7.3.2.2, add:

- (1) Measurement shall be parallel or at right angles to walls.
- (2) Supplemental hose valves outside the stairs shall not be located within tenant spaces, unless hose reach requirements cannot be met by placement of valves in public



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corridors or by use of wall hydrants for spaces opening to the exterior. Hose valve locations shall be marked by the placement of signs, the striping of columns, or other approved methods.

[22.00.06.37] 22.00.06.46

NFPA 14, paragraph 7.8.1.1, add exceptions:

Exception 1: In high-rise buildings, where booster pumps are necessary to produce the required residual pressures, pumps and piping systems must be sized to provide for the demand of the hydraulically most remote hose station, or the sprinkler system demand, whichever is greater. The standpipe system must also be sized to provide the required flow and pressure for all hose stations required to be flowing, when supplied by 150 psi at 1000 gpm at the fire department connection(s). Two sets of calculations will, therefore, be required under this exception.

Exception 2: Systems in buildings that are not high-rise, and dry systems with no automatic water supply, may be sized to obtain the required flows and pressures, when supplied by 150 psi at 1000 gpm at the fire department connection(s).

Exception 3: In existing buildings, after shell occupancy, hose valves added to correct reach violations created by tenant modifications may be supplied by 3 inch pipe without recalculation.

[22.00.06.38] 22.00.06.47

NFPA 20, paragraph [5.18.1.2] 4.7.7.2, add: A relief valve shall be permitted to be installed to reduce operating pressure below 175 psi at high gradient.

[22.00.06.39] 22.00.06.48

NFPA 20, paragraph [5.18.7] 4.18.7 is amended entirely to state: For other than static water supplies, relief valves shall not be piped back into the source of the supply.

[22.00.06.40] 22.00.06.49

NFPA 72, paragraph [4.4.6.1] 10.16.3, add the following sentence: An annunciator with the following features is required when the building is greater than one story, over 20,000 square feet in area per floor, or has more than one type of alarm initiating device.

Exception 1: Apartments protected by a 13R sprinkler system.

Exception 2: Any building not exceeding two stories above grade and 3,000 square feet per floor.



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- (a) Annunciator shall have a visible signal for each different floor, zone, and device type. Supervised computer screen or printer type annunciators may be used to meet this requirement if the zone identification is approved by the Fire Chief.
- (b) Unless otherwise approved by the authority having jurisdiction, zones shall not exceed a single floor, 20,000 square feet, or 300 linear feet. Sprinkler systems shall be permitted to be zoned in accordance with the applicable sprinkler standard.
- (c) If two or more zones per floor are required, a graphic outline on or adjacent to the annunciator shall be provided showing the building outline, fire alarm and sprinkler zone boundaries, "you are here" notation, north compass arrow, all stairways, stairway identification numbers, all standpipe risers, elevators, and the building address.
- (d) A lamp type annunciator shall have a lamp test switch unless the annunciator circuits are supervised.
- (e) The annunciator shall be located at, and visible from, the main fire department entrance unless the building has a fire command center.
- (f) If two or more buildings are controlled by one alarm system, an annunciator shall be installed in each building with a pilot lamp indicating the building of alarm origination.
- (g) The graphic annunciator orientation must match the building orientation.
- (h) The graphic annunciator floor level designations must match the elevator floor level designations.

[22.00.06.43] 22.00.06.50

NFPA 72, paragraph [5.7.1.7] 17.7.1.7 is amended as follows: Detectors located at the top of shafts and stairs shall be on a supervisory circuit only unless a confirmation or verification feature is provided. The location shall be identified at the annunciator or fire alarm control panel.

[22.00.06.41] 22.00.06.51

NFPA 72, paragraph [5.7.3.2.3.3] 17.7.3.2.3.3, add new paragraph [5.7.3.2.3.3.1] 17.7.3.2.3.3.1:

[5.7.3.2.3.3.1] 17.7.3.2.3.3.1. Detectors which activate required extinguishing systems on a cross-zoned or multiple-zone basis shall be spaced at a maximum of one-half of their allowed or listed square footage spacing.

[22.00.06.42] 22.00.06.52

NFPA 72, paragraph [5.7.4.2.2] 17.7.4.2.2, add: Activation of duct smoke detectors shall sound an audible alarm in a normally occupied area or through the building fire alarm system, and shall be identified as duct detector. Where connected to the building alarm, the signal shall be supervisory only and shall not initiate the building evacuation alarm unless a confirmation or verification feature is provided.



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[22.00.06.44] 22.00.06.53

NFPA 72, paragraph [5.11.2] 17.12.2, add: Standpipe or main water flow indicators, if provided, shall sound a supervisory signal only.

[22.00.06.45] NFPA 72, the second sentence under paragraph 5.13.4 is changed to read: "The center of each manual fire alarm pull station shall be between 42 and 48 inches above the floor level."]

[22.00.06. 46] 22.00.06.54

NFPA 72, paragraph [5.13] 17.16, is amended by adding subparagraph [5.13.9] 17.16.1.5

[5.13.9] 17.16.1.5 When fire alarm systems are not monitored by a UL listed central station, an approved permanent sign shall be installed adjacent to each manual fire alarm box. The sign shall read as follows:

Local Alarm Only:

- (1) Activate Alarm
- (2) Exit Building
- (3) Call Fire Department

[22.00.06.47] 22.00.06.55

NFPA 72, paragraph [6.10.1.15] 24.5.1.15 is amended by changing "two" to "six".

[22.00.06.48] [NFPA 72, paragraph 11.8.3.5, add new paragraph (11):]

[(11) Enclosed rooms with a closet such as dens, libraries, studies, or sitting rooms which could be used as a sleeping area shall be treated as bedrooms.]

22.00.06.56

NFPA 72, Section 24.5.2.2 is modified to read as follows:

"Radio Coverage. Radio coverage shall be provided throughout the building such that a minimum of 95% of the building (including underground levels, basements, elevators, stairways, ect.) is covered at a minimum of 95% of the time."

22.00.06.57

NFPA 72, Section 24.5.2.4.2, add: "The public radio enhancement system design shall be capable of being changed to accommodate updated frequencies in order to allow maintenance of the minimum



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system design criteria.”

22.00.06.58

Amend NFPA 72, add Section 24.5.2.5.5 to read as follows:

“At a minimum, a two inch diameter conduit/conduit sleeves shall be provided vertically from the roof level to the lowest level of the structure. This conduit will provide a vertical path for cable to all levels and should pass through the in-building public safety radio enhancement system equipment room. At a minimum, one 20-amp AC circuit and building ground shall be located at the public safety radio enhancement system equipment and any outside antenna locations.”

22.00.06.59

Amend NFPA 72, add Section 24.5.2.5.6 to read as follows:

“Secondary Power Source. The secondary power source shall provide enough capacity to power the in-building public safety radio enhancement system for 12 hours at 100 percent system operation capacity. Where the building is provided with a generator, the generator shall supply secondary power to the in-building public safety radio enhancement system.”

22.00.06.60

NFPA 72, Section 24.5.2.6.2 is deleted.

22.00.06.61

Amend NFPA 72, Section 24.5.2.8.1 to read as follows:

“Test procedures. The test plan shall ensure testing throughout the building. Test procedures shall be as directed by the design professional and the AHJ. Using the Montgomery County control channel, each floor shall be RF (radio frequency) signal level mapped utilizing a calibrated, portable spectrum analyzer. Each floor shall be divided into equal grids of no larger than 50 feet by 50 feet. Individual testing points shall not be spaced greater than 50 feet apart. Each grid shall meet the required signal strength level, and provide a Delivered Audio Quality (DAQ) of not less than 3.5. (DAQ 3.5 is defined as ‘Speech understandable with repetition rarely required. Some noise/distortion.’) A maximum of two non adjacent grids will be allowed to fail on the same floor. Failure of any two adjacent grids is considered a failure for the entire floor. Critical rooms, including, but not limited to, such areas as the fire command/control center, fire pump room, emergency generator room, stairwells with a standpipes, and other staging areas as identified by the AHJ shall not fail coverage at all. ”



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22.00.06.62

Amend NFPA 72, 24.5.2.8.2 to read as follows:

"The design and acceptance testing of the in-building public safety radio enhancement system shall be performed under the supervision of a Maryland registered professional engineer with a minimum of 5 years of experience in the design, installation, and alignment of bi-directional amplifier systems."

22.00.06.63

Amend NFPA 72, 24.5.2.9 to read as follows:

"Maintenance. The building owner shall maintain a service contract for emergency repair of the system. The service contract shall be such that telephone support is available within 2 hours and on-site service can be provided within 24 hours of recognition that the in-building public safety radio enhancement system is not operating correctly. A copy of the contract shall be submitted to the AHJ at the time of acceptance testing. If the building owner drops the service contract, the contractor shall notify the AHJ within 24 hours."

[22.00.06.48] 22.00.06.64

NFPA 72, paragraph [11.8.3.5] 29.8.3.4, add new paragraph [11] (13):

[11] (13) Enclosed rooms with a closet such as dens, libraries, studies, or sitting rooms which could be used as a sleeping area shall be treated as bedrooms.

Isiah Leggett
County Executive

Approved as to form and legality:

Office of the County Attorney/Date